

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~striethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered). Please CANCEL claims 1-9 and ADD new claims 10-19 in accordance with the following:

1. (CANCELLED)

2. (CANCELLED)

3. (CANCELLED)

4. (CANCELLED)

5. (CANCELLED)

6. (CANCELLED)

7. (CANCELLED)

8. (CANCELLED)

9. (CANCELLED)

10. (NEW) A method of processing metal members, comprising:

lapping at least two metal members one over the other;

placing a pair of rotors opposite to each other to put the lapped portions of the metal members between the rotors, said rotors each having a concave portion formed substantially at a center of a tip of the respective rotor;

pressing the tip of each rotor in a respective central axis direction, the rotors being rotated around respective central axes in opposite directions, against a surface of the lapped portions of the metal members;

forming a non-molten stirred layer by stirring a joining portion of the respective metal members with friction caused by the rotating of the rotors and the pressing of the tips while keeping the joining portion in a non-molten state, and stirring the metal members in the rotation directions of the rotors and in a direction of a thickness of the metal members in the respective concave portion; and

locally joining the lapped portion of the metal members.

11. (NEW) The method of processing metal members according to claim 10, further comprising forming the metal members in a predetermined three dimensional shape.

12. (NEW) The method of processing metal members according to claim 10, wherein the locally joining comprises locally joining the metal members at the joining portions.

13. (NEW) The method of processing metal members according to claim 10, further comprising forming an unevenness or wavy portion differing in height in a circumferential direction of the respective rotor on each of the tip portions.

14. (NEW) The method of processing metal members according to claim 10, further comprising inverting an alloy member between the joining portions, wherein said alloy member is diffusive to the metal members, wherein

the locally joining comprises the forming of the non-molten stirred layer and then diffusing the alloy member to the non-molten stirred layer.

15. (NEW) The method of processing metal members according to claim 10, further comprising removing burrs produced on the metal members in a vicinity of the rotors due to the rotating and pressing motion of the rotors during the locally joining.

16. (NEW) An apparatus to locally join lapped portions of metal members, comprising:

first and second rotors opposite to each other to put the lapped portions of the metal members therebetween, said rotors each having a tip and a concave portion formed substantially on a center of the tip; and

a controller to control a rotating and a pressing motion of the rotors to press the tip of each rotor in a respective central axis direction, the rotors rotating around the respective central axes in opposite directions, against surfaces of the lapped portions of the metal members, to form a non-molten stirred layer by stirring respective joining portions of the metal members by the use of friction caused by the rotating and pressing motions of the rotors while keeping the joining portions in a non-molten state, to stir the metal members in the rotation directions of the rotors and in a direction of a thickness of the metal members in the concave portions, and then to locally join the lapped portions of the metal members.

17. (NEW) The apparatus for processing metal members according to claim 16, wherein the tip portions each comprise an unevenness or wavy portion differing in height in a circumferential direction of the rotors.

18. (NEW) The apparatus for processing metal members according to claim 16, wherein each rotor further comprises a cutting portion formed on an outer circumferential surface of the respective tip portion, and said cutting portion removes burrs produced on the metal members in a vicinity of the rotors due to the rotating and pressing motion of the rotors.

19. (NEW) The apparatus for processing metal members according to claim 16, wherein each rotor further comprises a pressing portion formed on an outer circumferential surface of the respective tip portion, and said pressing portion presses burrs produced on the metal members in the vicinity of the rotors due to the rotating and pressing motion of the rotors.